

CCD Color Camera

KP-D8

OPERATION MANUAL

Please read this operation manual carefully for proper operation, and keep it for future reference.

 **Hitachi Denshi, Ltd.**

CCDカラーカメラ

KP-D8

取扱説明書

このたびは日立**CCD**カラーカメラをお買い上げいただきありがとうございます。

この取扱説明書には、あなたや他の人々への危害や財産への損害を未然に防ぎ、この機器を安全にお使いいただくために、守っていただきたい事項を示しています。ご使用になる前に、取扱説明書をよくお読みいただき、正しい使い方でご愛用ください。

お読みになった後も、この機器のそばなどいつも手元に置いてご使用ください。

 **日立電子株式会社**

Table of contents

CAUTION FOR SAFE OPERATION	A
IMPORTANT NOTICE	B
General	1
Features	1
Operating considerations	2
Phenomena inherent to CCD imaging device	3
Section names and functions	4
Setting of switches	5
Basic connection	7
① Connection of composite video output	7
② Connection of Y/C signal output	8
Pin arrangement of DC IN/VIDEO	9
Lenses	10
Note on lens selection	10
Auto iris lens plug	11
Pin arrangement of lens connector	12
Auto iris lens	12
Lens mount	12
Flangeback adjustment	13
Camera mounting	14
Installation of tripod adaptor	14
Camera mounting	14

Junction box JU-D8	15
Connection with junction box JU-D8	16
① Connection of composite video output	16
② Connection of Y/C signal output	17
Connection with junction box JU-M1A	18
Remote control	19
Connection of junction box JU-D8 and a personal computer	20
Main specifications	22
Supplied accessories	23
Optional accessories	23
External view	24
KP-D8	24
Tripod adaptor TA-D8	25
Junction Box JU-D8	26
Internal connection of JU-D8	27

Note: The model and serial numbers of your product are important for you to keep for your convenience and protection. These numbers appear on the nameplate located on the bottom of the product. Please record these numbers in the spaces provided below, and retain this manual for future reference.

Model No. _____

Serial No. _____

General

The Hitachi KP-D8 is 1/3" CCD color camera using a digital signal processing circuit.

Features

Very small,compact,self-contained color camera

- Only a power is needed to produce high quality pictures.
- The camera requires a very small space for installation, allowing use for various purpose and conditions

High sensitivity,high resolution

- Minimum illumination 4 lx (with F1.2 lens, AGC ON) and 470 TVlines (Horizontal) using a 1/3" CCD with 410,000 pixels (NTSC)/470,000 pixels(PAL) with the micro lenses on each pixel.

Digital signal processing

- High quality picture provided by digital signal processing functions such as 2H enhancer, and aperture correction.

Automatic electronic shutter control

- Output signal level is continuously maintained at the optimum video level for a fixed iris lens.

The shutter speed is automatically controlled from normal(1/60s for NTSC,1/50s for PAL) to 1/180,000s, contrast ratio is over 3,000 times.

Y/C outputs (switchable from VBS output)

White balance control

- Auto tracking white balance
- Preset white balance

C mount lens is usable with adaptor(LA-D8)

Video output for auto iris lens

Remote control(with optional JU-D8)

Operating considerations

Power supply

Be sure to use the power source specified in the Major Specifications.

- Before plugging or unplugging a connector, be sure to turn off power.
To plug or unplug a connector, be sure to hold the connector section.
- Note that it will take several seconds until a picture is displayed on the monitor after power on.

Handling

- Do not attempt to remove cover.
- When installing or removing a lens, be sure to use care that water or dust does not enter the inside of the camera.

Installing and storage

Avoid installing or storing the camera in the following environments.

- Environments exposed to direct sunlight, rain or snow
- Environments where combustible or corrosive gas exists
- Excessively warm or cold environment (Operating ambient temperature: -10 to 50°C)
- Humid or dusty environment
- Place subjected to excessive vibration or shock
- Environment exposed to strong electric or magnetic field

- Do not aim the camera lens at the sun.
- Do not shoot strong light or a scene including strong light.

When such a scene is shot, vertical trailings will appear. However, this is not due to failure.

In case strong light enters the camera through the lens, partial deterioration in picture quality will result.

To obtain stable performance for long time

When the camera is used continuously for long time under high ambient temperature, the inside electrical parts become deteriorated, resulting in shortening its life.

To use the camera continuously for long time, the highest temperature must be below 40°C .

Cleaning

- Use a blower or a lens brush to remove dusts on the lens or the optical filter.
- Wipe dirt on the case off with dry soft cloth. If dirt is hardened, wipe them off with cloth moistened with neutral detergent liquid; wipe the cover with dry cloth.
- Do not use benzine, thinner, alcohol, liquid cleaner or spray-type cleaner.

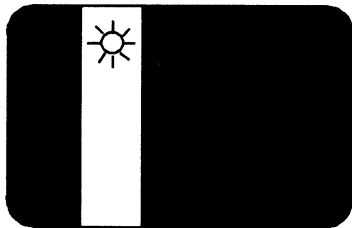
Phenomena inherent to CCD imaging device

Following are the phenomena inherent to a CCD imaging device, and not defects

1) Smear and blooming

When strong light (lamp, fluorescent lamp, reflected light, etc.) is shot, pale bands are displayed vertically above and below the light.

In this case, change the angle of the camera so that such strong light does not enter the camera through the lens.



2) Fixed pattern noise

When the camera is operated in a high temperature, fixed pattern noise may appear on the entire screen.

3) Moire

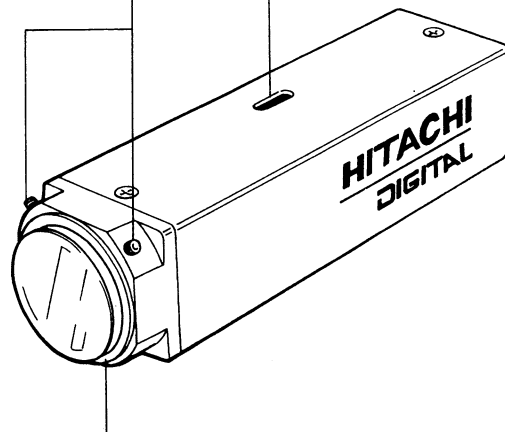
When fine patterns are shot, moire may be displayed.

4) Burning

When excessively intense light comes to the CCD for a long time, the spectral filter in the CCD pixel may be deteriorated, and the color of the corresponding portion may change. Avoid using the camera under such condition.

Section names and functions

Lens mount setscrew
See flangeback adjustment
on page 13.

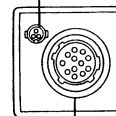


Lens mount ring
See flangeback adjustment on page 13.

Mode select switch
See mode selection on page 5.

Lens connector

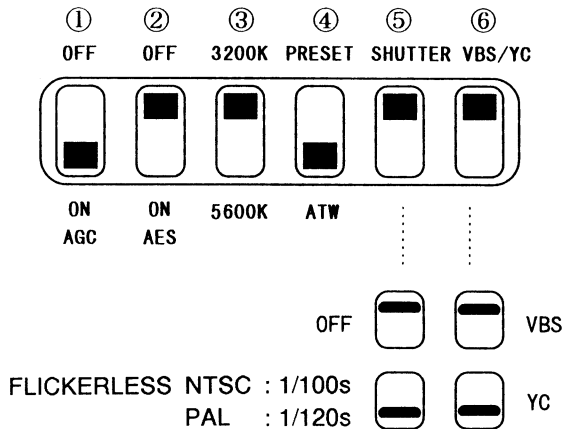
When using an auto-iris lens, connect
the lens cable to this connector.



DC IN / VIDEO connector

See the pin arrangement on page 9.
See the connections on page 7 and
15.

Setting of switches



① AGC ON/OFF switch

ON : AGC gain is controlled from typical gain to 8 times higher automatically.(Factory setting is ON)

OFF : Fixed normal gain

Note Although the sensitivity increases when AGC gain is increased, noise can increase in dark scene.

② AES(Automatic electronic shutter) ON/OFF switch

ON : Controlled normal (NTSC:1/60s,PAL:1/50s) to 1/180,000s automatically.

OFF : Fixed shutter speed selected by electronic shutter switch ⑤(Factory setting is Normal, OFF)

③ ATW 3200K/5600K

Auto-tracking white balance range switch in the ATW and PRESET mode the white balance is automatically controlled.

Auto-tracking white balance control range can be selected.

3200K: Control range is the color temperature range of 2,500 to 8,000K.

The factory setting is this mode, which is

suitable for most situations.

5600K: Control range is the color temperature range of 5,000 to 8,000K, which is suitable for daytime outdoors or under mercury illumination.

④ White balance mode switch

- (1) ATW(Auto tracking white balance) mode White balance is controlled in the range of the 3200K/5600K control mode by detecting the color balance of the whole field.
- (2) PRESET(One time ATW operation) mode Auto tracking white balance operation only one time, and it holds the white balance after preset operation.
This mode is fit for under the same light condition continuously.

Note

ATW operation does not perform properly under the following condition

- When the identical color accounts for most of the scene or very little in the white.
- When illuminated with plural, different light sources.

⑤ Electronic shutter speed switch

When AES switch is set to OFF, this selection is effective.

- (1) OFF:Normal(set in the factory)
NTSC:1/60s,PAL:1/50s
- (2) Frickerless:
NTSC: 1/100s, PAL: 1/120s

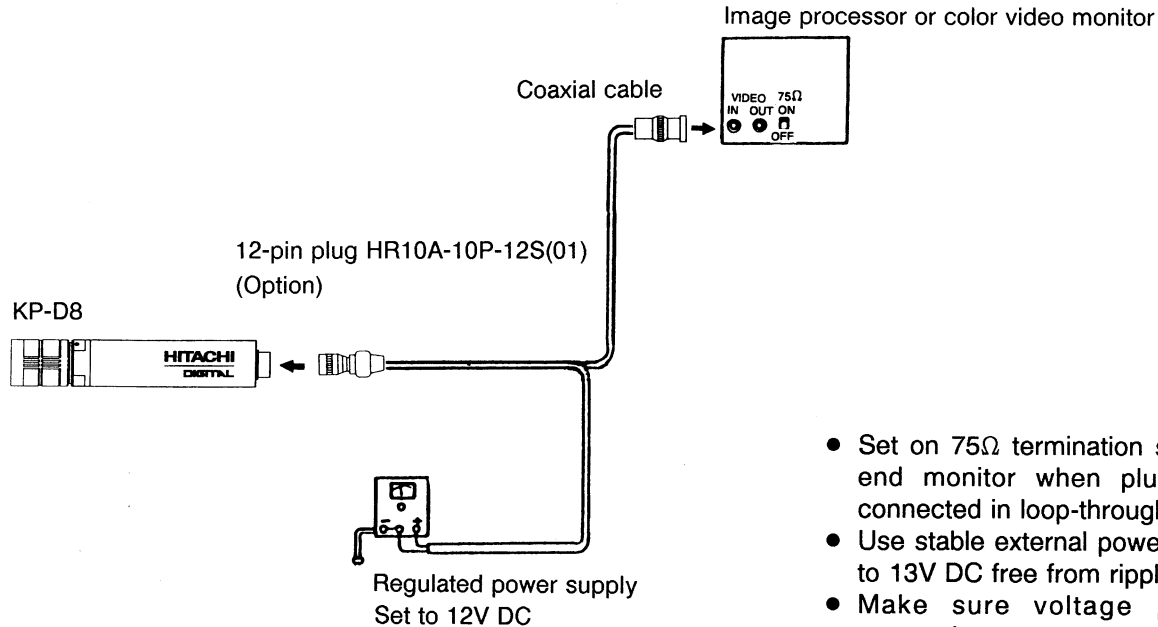
⑥ VBS/YC switch

- VBS: Select this position to output the VBS signal from the DC IN/VIDEO connector.
(Factory setting)
- YC: Select this position to output the Y/C separated signal from the DC IN/VIDEO connector.

Basic connection

① Connection of composite video output

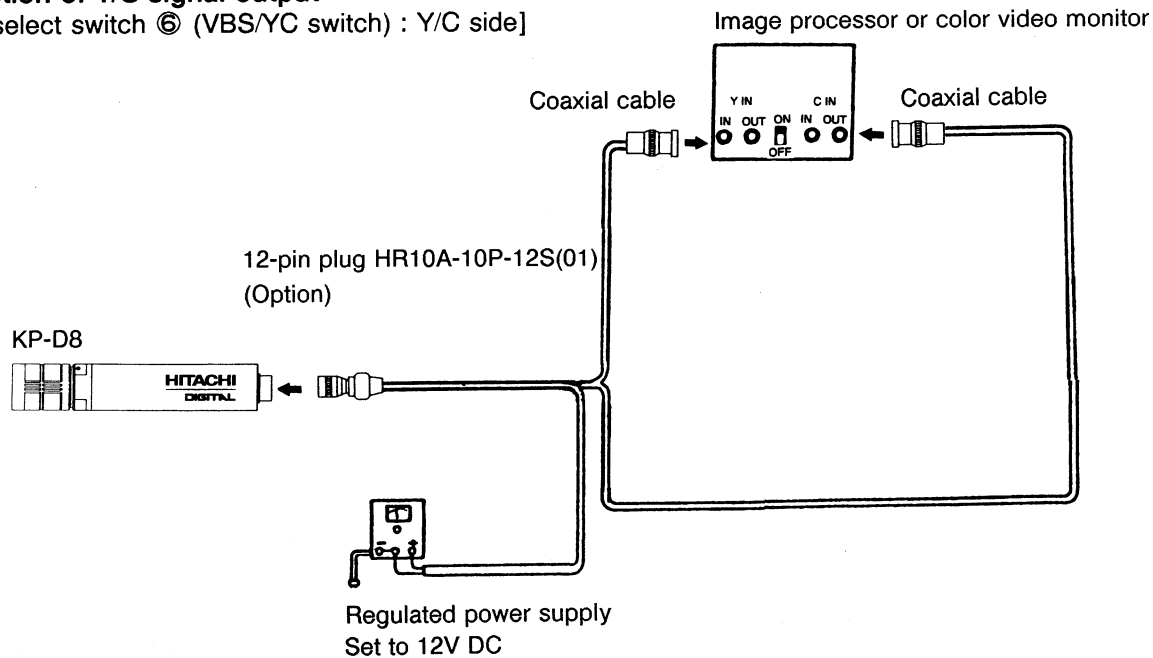
[Mode select switch ⑥ (VBS/YC switch) : VBS side]



- Set on 75Ω termination switch only of the end monitor when plural monitors are connected in loop-through.
- Use stable external power supply within 11 to 13V DC free from ripples or noises.
- Make sure voltage polarity before connecting external power supply.
- Available voltage range is 11 to 13V.
- Before turning on an external power supply unit, be sure to check the polarity of the power supply.

② Connection of Y/C signal output

[Mode select switch ⑥ (VBS/YC switch) : Y/C side]



Pin arrangement of DC IN/VIDEO

Pin	Signal	Remarks
1	GND	Ground
2	+ 12V	DC 12V input
3	GND(VBS/Y)	Video(VBS/Y) signal ground
4	VBS/Y	Video(VBS/Y) signal
5	GND(TX)	Serial data TX ground
6	TX	Serial data TX(3.3V-TTL) Note
7	RX	Serial data RX(3.3V-TTL) Note
8	GND(C)	Chrominance(-/C) signal ground
9	-/C	Chrominance(-/C) signal
10	GND	Ground
11	+ 12V	DC 12V input
12	GND(RX)	Serial data RX ground

Model name of DC IN/VIDEO connector(Part code)

HR10A-10R-12PB(01) (JMH0109)

Model name of camera cable plug(Part code)

HR10A-10P-12S(01) (JMH0110)

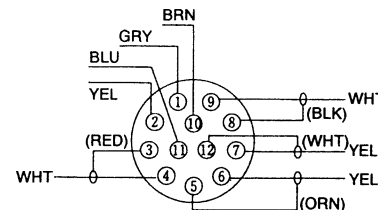
Optional cables

Cables dedicated for connecting the camera head and the junction box JU-D8 are available as option.

Note

- The video signal output is for composite(VBS)at the factory. Connect a monitor or other equipment to pin 4. At this setting, there is no signal output from pin 9.
- When the video output is changed to Y/C, the luminance (Y) signal is obtained from pin 4 and the chrominance (C) signal from pin 9.
- Be sure to use less than 3.3 V TTL level for serial data TX(pin 6), RX(pin 7) input/output. Damage can occur if 3.3 V is exceeded.
- The junction box JU-D8 contains a level converter circuit and should be used for interfacing the camera with the RS-232C port of a personal computer. Junction box has the RS-232C interface to convert 3.3V TTL level.

Length	Type
2m	C-201KSM
5m	C-501KSM
10m	C-102KSM



Lenses

A small special mount is used.

Select a special mount lens from the following table.

Type	Lens model	Specifications	Angle of view
Manual iris	TF812	8 mm F1.2	Hor. 32degrees
	TF316	3.7 mm F1.6	Hor. 72degrees
	TF1214	12 mm F1.4	Hor. 22degrees
Auto-iris	HS720JX(XE)	7 mm F2.0 with 3-pin plug	Hor. 38degrees

C-mount lens

The LA-D8 C-mount adaptor allows using C-mount lenses.

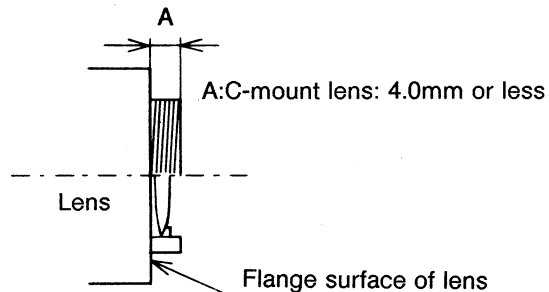
(CS-mount lens cannot be used.)

Note on lens selection

- 1) Observe the maximum size limit(A in the figure) when installing the C-mount lens. Internal damage can be occur if a larger lens is used.
- 2) Avoid using a lens that is heavier than the camera. If unavoidable, be sure to provide a supporting means for the lens.

Caution:

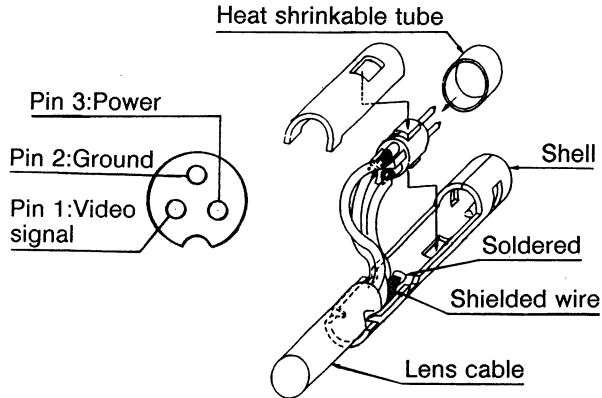
A heavy lens can disturb the balance with respect to the camera and possibly result in damage.



Auto iris lens plug (Optional accessory)

When you use a auto iris lens which does not have auto iris lens plug for this camera,make the connection of the lens plug.

- 1) Remove the plug from the lens cable.
Place the heat shrinkable tube over the cable.
- 2) Solder the shielded wire onto the inside of the shell as illustrated.
- 3) Solder the cable wires to the pins of the plug.
(To identify the cable wires, refer to the manual for your lens)

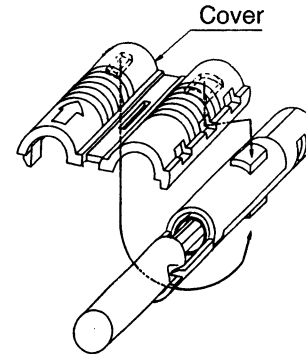


- 4) After soldering, slide the heat shrinkable tube up against the terminal block. Secure the wires by heating the heat shrinkable tube with a soldering iron or dryer.
- 5) Place the terminal block to one half of the shell, then fit the other half of the shell.
- 6) Fit the plastic cover over the shell.

Note

When soldering the wires to the plug pins, solder them with a soldering iron temperature of less than 280°C(540°F).

Perform the soldering quickly within three seconds.



Pin arrangement of lens connector

Pin	Signal	Remarks
1	IRIS.V	Video signal
2	GND	Ground
3	+ 12V	DC 12V(40mA or less)

Model name of lens connector(Part code)

SR38-4R-3S (JJS0050)

Model name of lens plug(Part code)

SR38-4P-3P (JPS0040)

Auto iris lens

If the auto iris lens does not have a plug for connecting to the camera, procure an optional lens plug and install it on the lens cable.

Refer to the lens instructions regarding the cable lead colors and signals.

Note

The plug is very small and fragile.

Take special care when handling it.

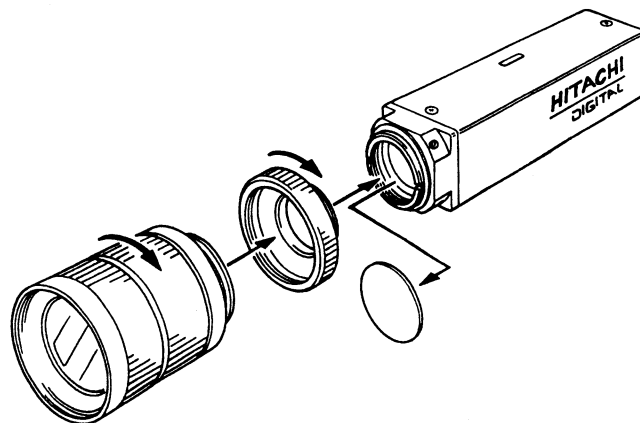
Do not pull the lens cable connected the lens plug .

If you do, the plug or camera lens connector may be damaged.

Set the lens detector response as close as possible to AVE(Average). Hunting can occur if set to Peak.

Lens mount

Peel off the protective seal of the camera lens mount and install the LA-D8 C-mount adaptor. A C mount lens can then be attached.(Only using a C-mount lens)



Note

When using auto iris lens, place lens cable closely to the camera to prevent electro-magnetic noise.

Flangeback adjustment

Adjust the flangeback if the focus cannot be adjusted after installing or replacing the lens, or at the wide and telephoto extremes of a zoom lens. Open the lens iris and adjust as described below.

1. Fixed focus lens

Set the lens focus ring to infinity and pickup an object at least 20 meters distant.

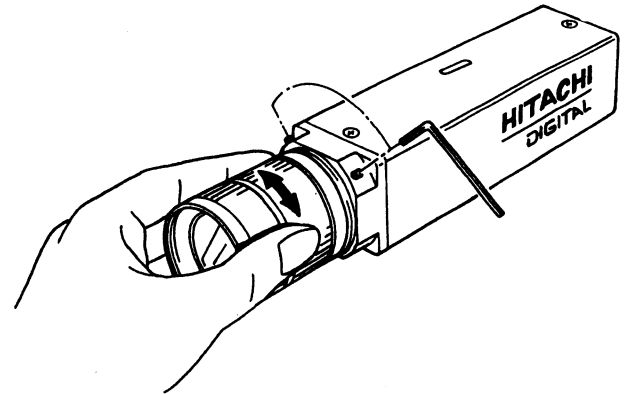
Loosen the (two) lens mount setscrews by using the rench supplied with the camera and adjust the focus by turning the lens and lens mount ring. After adjusting , tighten the lens mount setscrews.

2. Zoom lens

- 1) Set the lens to maximum telephoto and pickup an object at least 3 meters distant. Loosen the (two) lens mount setscrews and adjust the focus by turning the lens and lens mount ring.
- 2) Set the lens to maximum wide angle and pickup the same object. while using care not to disturb the focus ring, adjust the focus by turning the lens and lens mount ring.

Repeat these steps until focus is obtained at both the telephoto and wide angle setting.

After adjusting, tighten the lens mount setscrews.

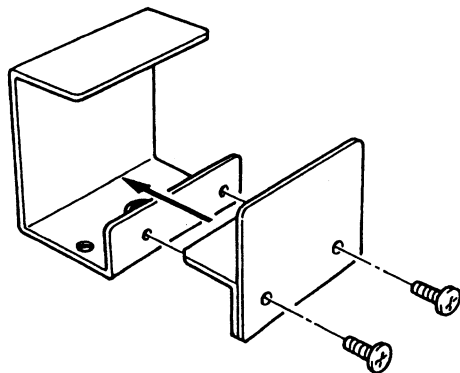


Camera mounting

When mounting the camera on a tripod, please use the optional tripod adaptor TA-D8.

Installation of an optional tripod adaptor.

1. Loosen the (two) setscrews. When you can not mount the camera with a lens, disassemble the tripod adaptor parts.
2. Mount the camera on the tripod adaptor.
When you have finished installation, tighten the setscrews to secure the camera.



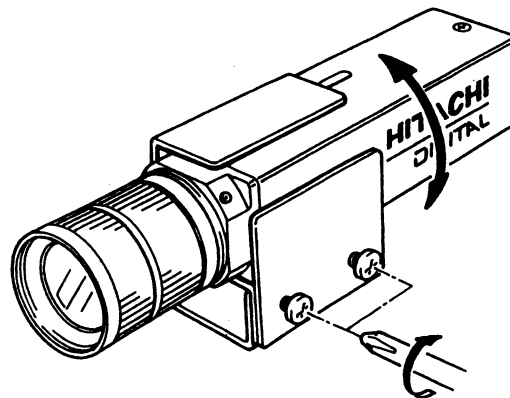
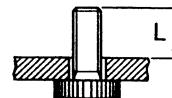
Camera mounting

Important: Be sure to use the proper mounting screw. See below.

If the screw other than specified is used, the camera cannot be installed securely or may drop, resulting in damage.

U1/4-20

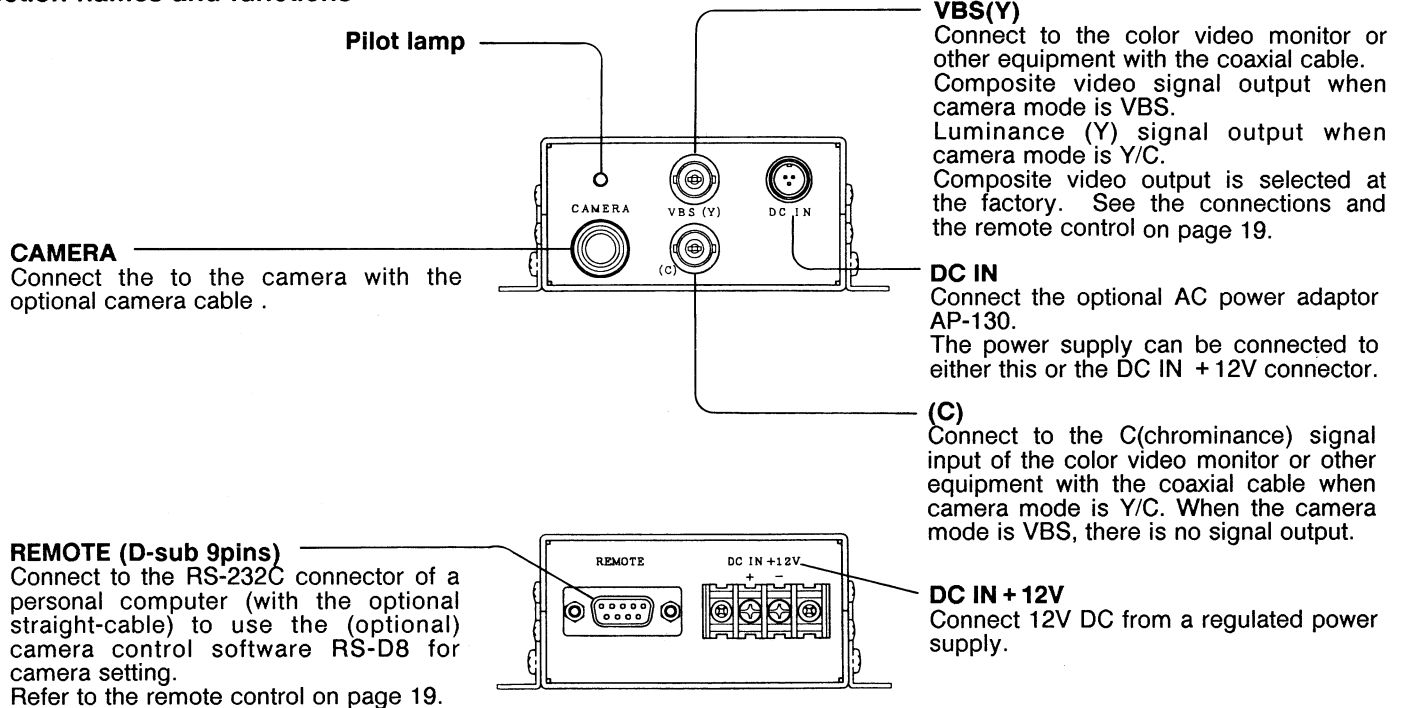
L = 4.5 to 7 mm



Junction box JU-D8

JU-D8 is the connector conversion box containing an RS-232C interface circuit.

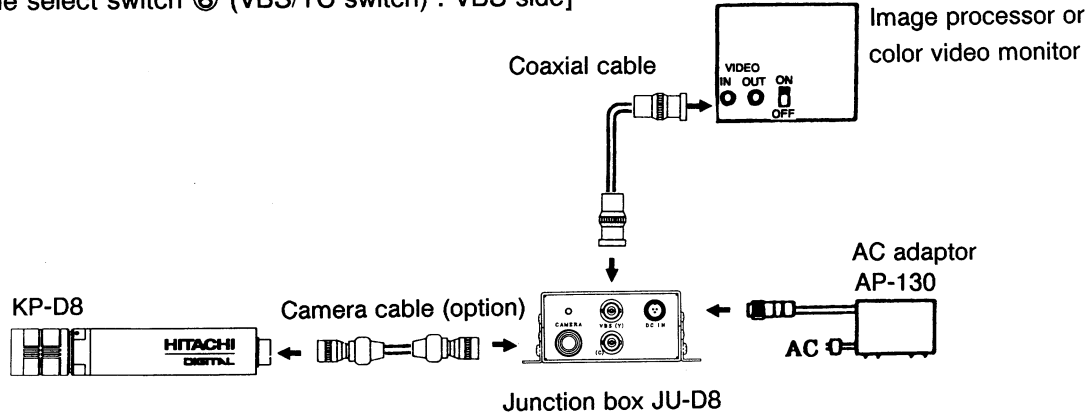
Section names and functions



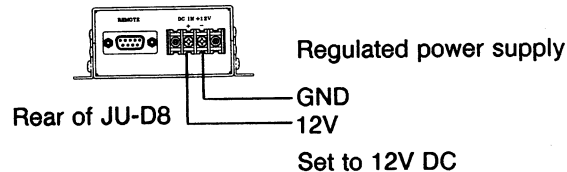
Connection with junction box JU-D8

① Connection of composite video output

[Mode select switch ⑥ (VBS/YC switch) : VBS side]

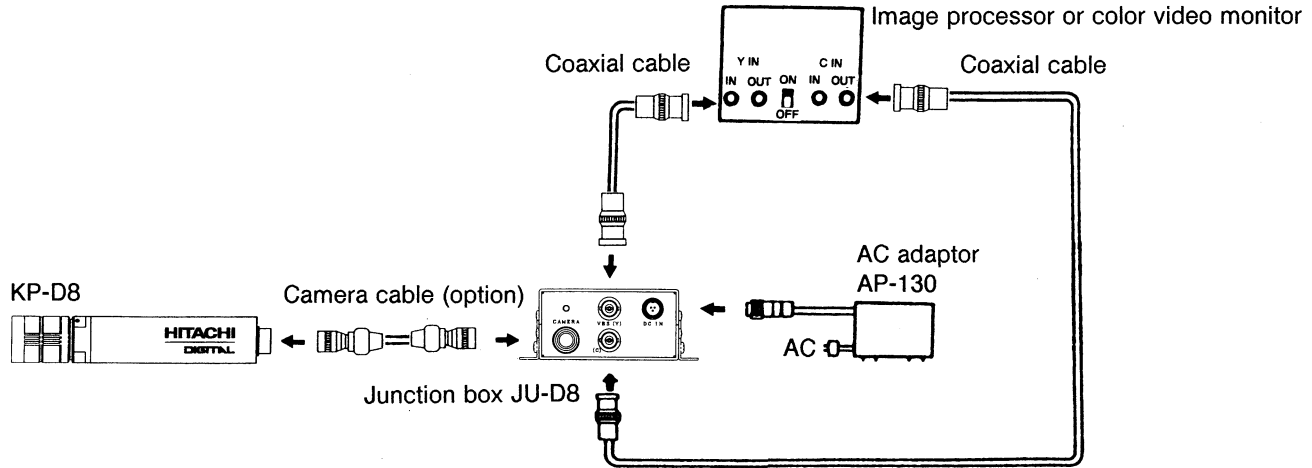


When not using the AP-130, supply 12V from rear of the JU-D8.

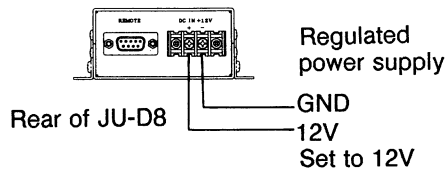


② Connection of Y/C signal output

[Mode select switch Ⓢ (VBS/YC switch) : Y/C side]



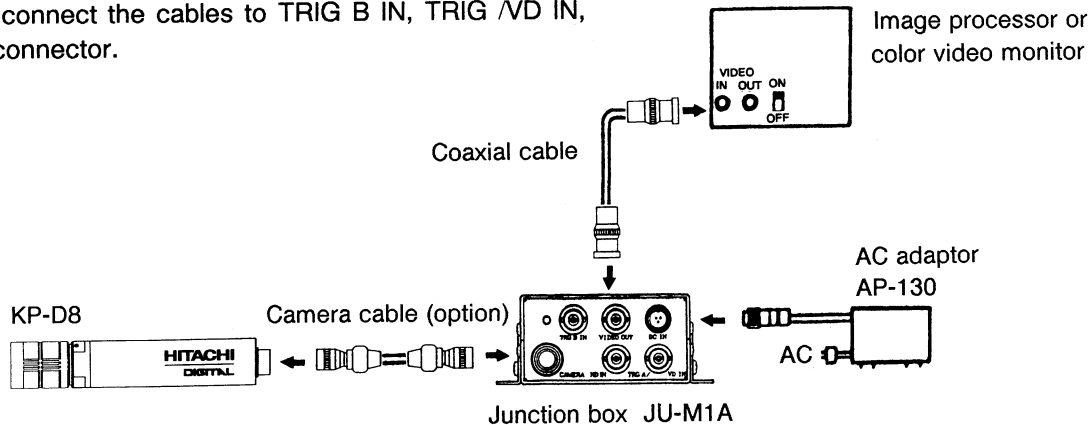
When not using the AP-130, supply 12V from rear of the JU-D8.



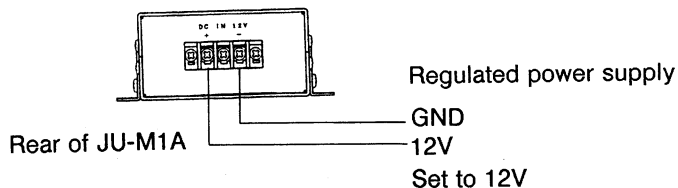
Connection with junction box JU-M1A

Connection of composite video output

Do not connect the cables to TRIG B IN, TRIG /VD IN, HD IN connector.



When not using the AP-130, supply 12V from rear of the JU-M1A.



Remote control

A personal computer with Windows 95(R) is required for camera settings using the remote control software.

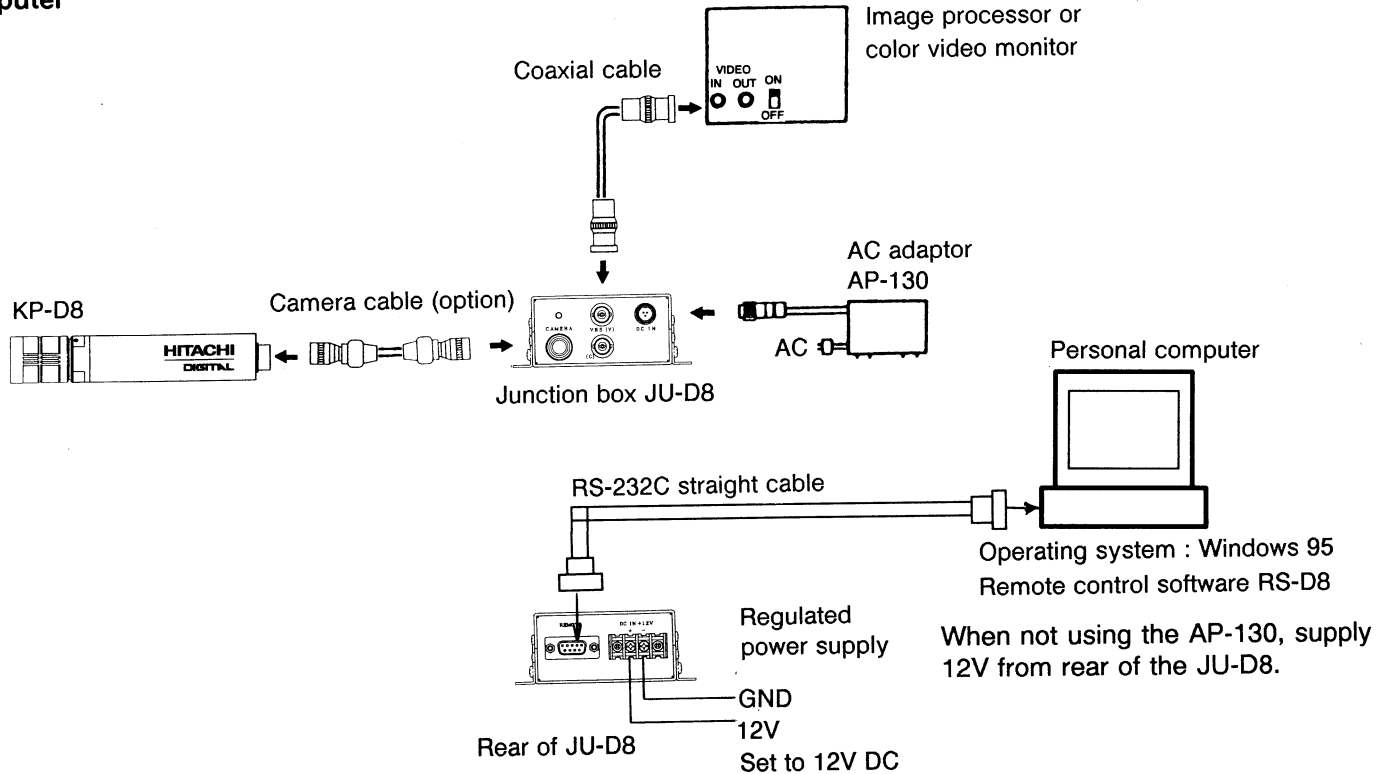
The following items can be set.

The remote controllable items

- 1.Video signal output VBS or Y/C
- 2.AGC ON or OFF
- 3.White balance mode ATW, Preset or Manual(R/B gain adjustable)
- 4.ATW control range 3200K or 5600K
- 5.Auto electronic shutter
AES ON or OFF
- 6.Shutter speed Normal to 1/20,000s in 9 steps
- 7.Polarity of VBS or Y/C output
Normal(positive) or negative
- 8.Contour compensation
Adjustable
- 9.Chrominance level Adjustable
- 10.Gamma correction ON or OFF
- 11.Control priority Camera switches or remote control

Windows 95 is the trademark of Microsoft corporation.

Connection of junction box JU-D8 and a personal computer

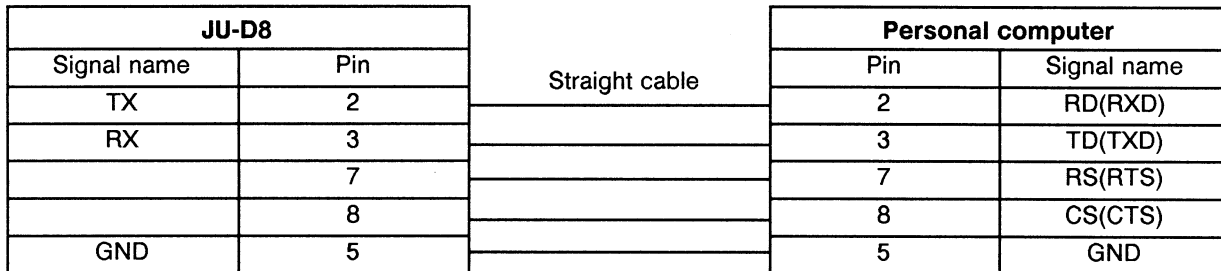




Connection of JU-D8 and personal computer

Use a straight interface cable for connecting the JU-D8 Junction Box to the RS-232C port of the personal computer. The following 5 signals needed to be connected. Check when preparing the cable.

Connection for the IBM PC compatible



Plug : D-sub 9 pins (male)

Plug : D-sub 9 pins (female)

Main specifications

1.Color system	NTSC/PAL
2.Pickup element	1/3"Interline transfer type CCD
Total pixels	NTSC: 811(H)x508(V) PAL : 795(H)x596(V)
Effective pixels	NTSC: 768(H)x494(V) PAL : 752(H)x582(V)
Scanning area	NTSC: 4.9(H)x3.7(V) μ m PAL : 4.9(H)x3.6(V) μ m
3.Scanning system	2:1 Interlaced
4.scanning frequency	Hor. NTSC: 15.734kHz PAL : 15.625kHz Vert. NTSC: 59.94Hz PAL : 50Hz
5.sync system	Internal
6.Signal processing	Internal digital processing (input: 9bits, output: 8bits)
7.Video signal output	VBS:1.0Vp-p/75 Ω or Y/C Y:1.0Vp-p/75 Ω C :0.3Vp-p/75 Ω (Burst)
8.S/N (Luminance signal)	More than 48dB AGC, enhancer, and gamma:OFF
9.Resolution	Hor. NTSC:470 TVlines PAL :460 TVlines Vert. 350 TVlines

10.Minimum illumination

4 lx
(F1.2 3200K, AGC maximum gain)

11.Scene illumination range

4~100,000 lx
(F1.2 ES lens, AGC ON)

12.AGC

ON/OFF selectable
(Maximun gain 18dB)

13.Electronic shutter speed

Selectable one of 2steps
Normal(OFF)
(NTSC 1/60s, PAL 1/50s)
NTSC 1/100s, PAL 1/120s

14.Auto electronic shutter

ON/OFF selectable
ON: Normal to 1/180,000s

15.White balance control mode

Selectable one of 2 modes
(1)ATW (Auto tracking mode)
(2)Preset (Preset auto mode)

16. White balance control range

Selectable one of 2 range

- (1) 3200K (Indoor condition)
- (2) 5600K (Outdoor and mercury lamp)

Range of 2,500~8,000K

17. Output for auto iris lens

Video : 1.0Vp-p/High impedance

Power : DC 12V 40mA or less

18. Lens mount

Special mount

Dia. 17mm, meter type screw
C-mount adaptor is option.

19. Ambient conditions

10~+50°C, 20~80%RH (Note)

Caution: When the camera is used continuously for long time, be sure to use it at less than 40°C to ensure stable performance.

20. Storage conditions -20~+60°C, 20~90%RH

21. Anti-vibration 3G or less

22. Shock resistance Less than 70G

23. Power requirement DC 12V ± 1V

24. Power consumption 150mA

25. Dimensions 22(W)x22(H)x86(D) mm

26. Mass 80g approx.

Supplied accessories

Operation manual

C-mount adaptor LA-D8

Lens mount setscrew wrench (0.9mm 8551837-B)

Optional accessories

Special mount lens (See the usable lenses on page 10)

Tripod adaptor TA-D8

C-mount lens

Camera cable C-201KSM(2m) (23856AX)

C-501KSM(5m) (23857AX)

C-102KSM(10m) (23858AX)

Junction box JU-D8

(Built-in RS-232C interface)

Junction box JU-M1A

DC IN/VIDEO plug HR10A-10P-12S(01) (JMH0110)

AC adaptor AP-130U(AC117V/12V 350mA)

AC adaptor AP-130E(AC220V/12V 350mA)

AC adaptor AP-130K(AC240V/12V 350mA)

Lens plug for auto iris lens

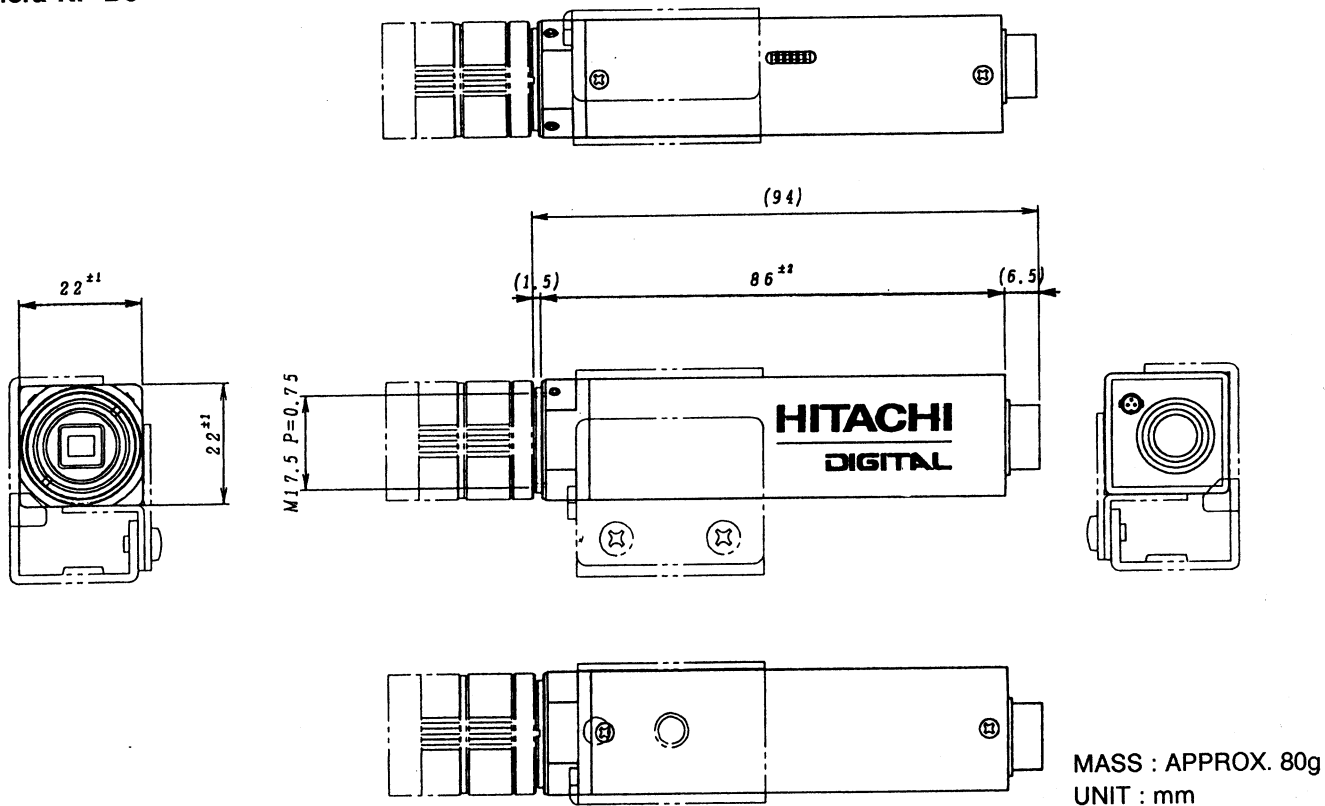
SR38-4P-3P(JPS0040)

Remote control software

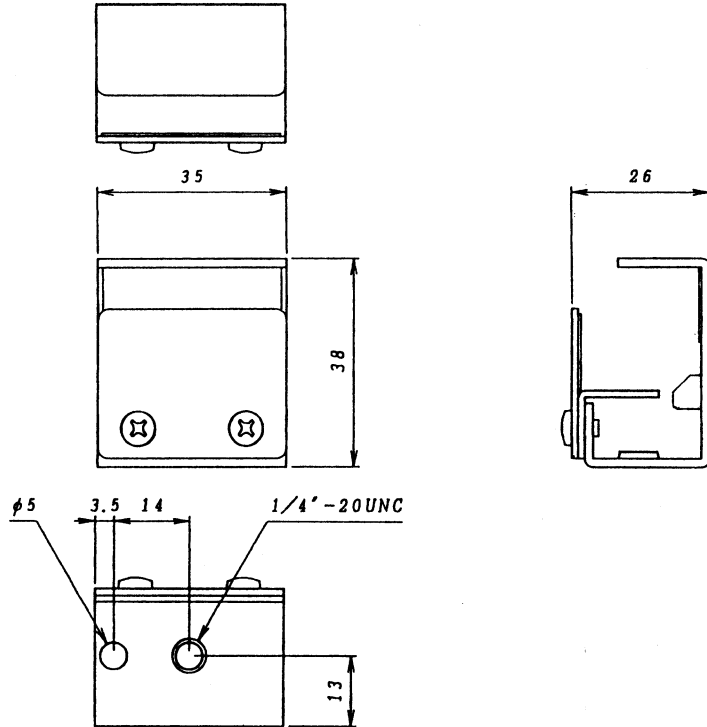
RS-D8

EXTERNAL VIEW

● Camera KP-D8

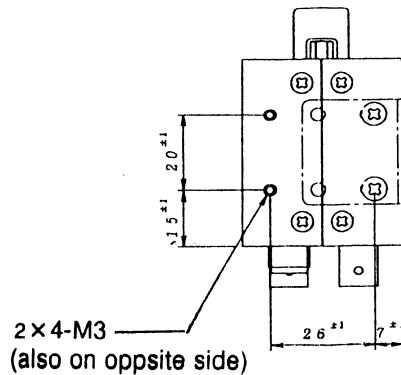
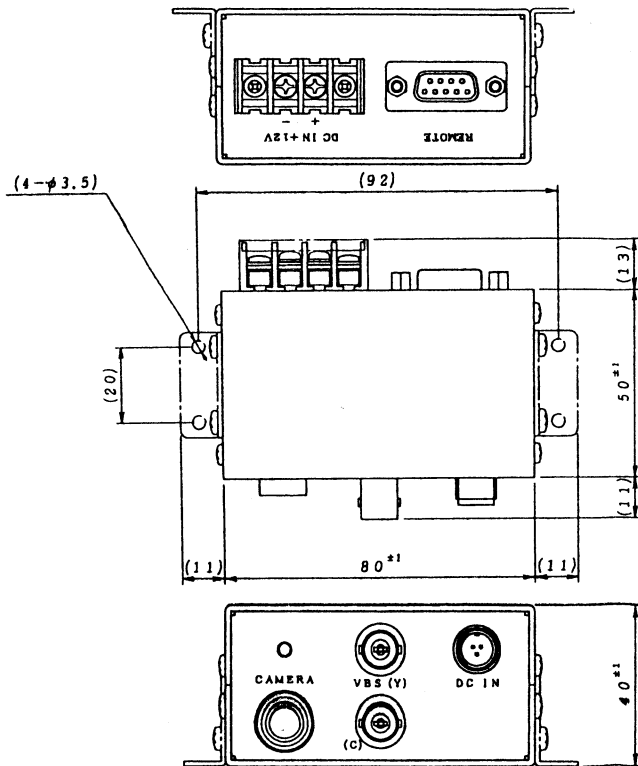


• Tripod adaptor TA-D8



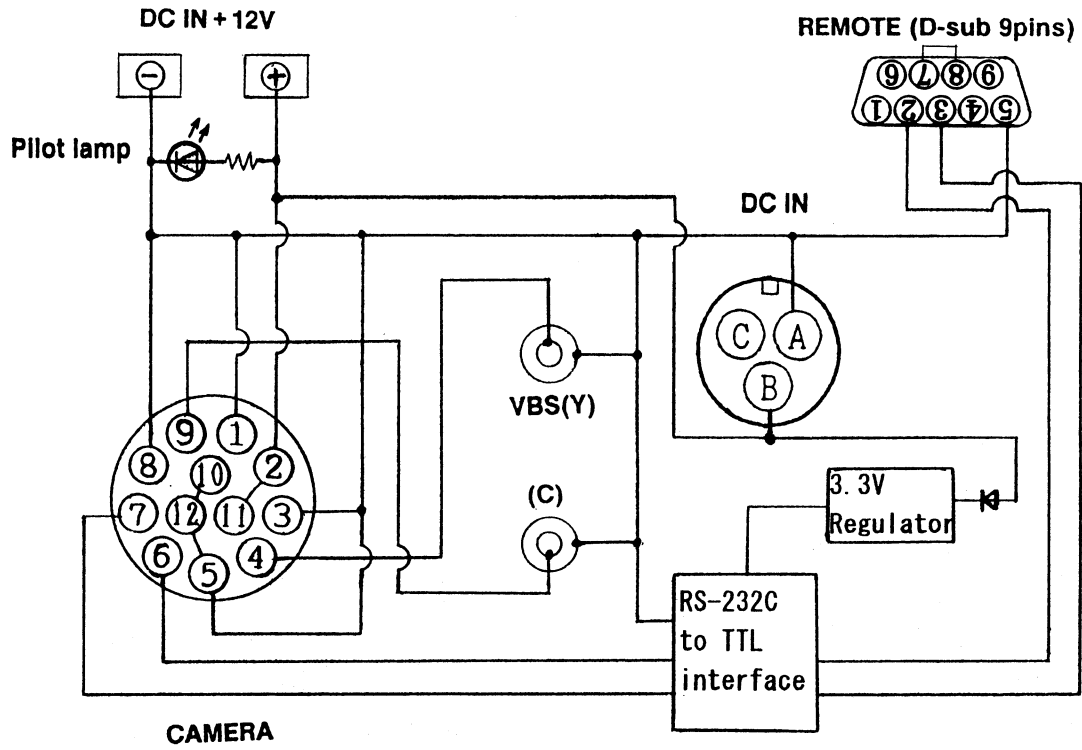
MASS : APPROX. 60g
UNIT : mm

● Junction box JU-D8



MASS : APPROX. 180g
UNIT : mm

Internal connection of Junction box JU-D8



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